DOCUMENT RESUME

ED 148 093 EC 103 557

AUTHOR	Watson, Daniel L.; Hall, Deborah L.
TITLE	Self-Control of Hyperactivity.
INSTITUTION	LaMesa - Spring Valley School District, Calif.
SPONS AGENCY	California State Dept. of Education, Sacramento.
PUB DATE	29 Jul 77
GRANT	76-26-D
NOTE	48p.
EDRS PRICE	MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS	*Behavior Change; *Contingency Management; Exceptional Child Research; *Hyperactivity; Intermediate Grades; *Progressive Relaxation; *Regular Class Placement; *Self Control
IDENTIFIERS	*Biofeedback

ABSTRACT

Evaluated with 86 children (grades 4 through 6) in both regular and special education classes were techniques for teaching children self control of hyperactivity in the regular educational setting. Ss were divided into three groups: control group; placebo-control group, receiving sensorimotor training; and the experimental group, receiving a combination of training in relaxation, biofeedback, and cognitive behavior modification. Pre and post evaluation was done on hyperactive behavior, physical performance, attention span, and muscle tension level. Results showed that the experimental group scored significantly higher on reading comprehension skills and reduced hyperactive behavior significantly more than the control groups. (Author/SBH)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED148093

SELF-CONTROL OF HYPERACTIVITY

Daniel L. Watson, Ph.D.
Deborah L. Hall, M.S.

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Prepared Under Grant No. 76-26-D Between the
California State Department of Education and
the La Mesa-Spring Valley School District

Pupil Services Division
La Mesa-Spring Valley School District
July 29, 1977

EC 103 557

FOREWORD

Statement of funding:

The study reported here was part of a program of research in Special Education in the Pupil Services Division, (Division of Grant Institution) La Mesa-Spring Valley School District. (Grant Institution) The study was carried out during the academic year 1976-77 (Year of Study) under the auspices of the Special Education Research Program, supported by Grant No. 76-26-D (Grant #) between the State Department of Education and La Mesa-Spring Valley School District. (Grant Institution)

Disclaimer:

The full report is reproduced here in this form for distribution as a technical report under the grant, and in order to make complete findings available for others engaged in this research area. Results of this study are the sole responsibility of the investigators. Official endorsement of the California State Department of Education or La Mesa-Spring Valley School District (Grant Institution) is not implied.

David F. Watkins
Principal Investigator

7/29/77
Date

ABSTRACT

Techniques were evaluated for teaching children self-control of hyperactivity in the regular educational setting. Eighty-six fourth, fifth, and sixth grade children in both regular and special education classes were divided into three groups: the control group; the placebo-control group, receiving sensorimotor training; and the experimental group, receiving a combination of training in relaxation, biofeedback, and cognitive behavior modification. Children in the placebo-control group and the experimental group received twelve 30 minute training sessions over a six week period. Pre and post evaluation was done on hyperactive behavior, physical performance, social dimensions, cognitive integration, academic performance, attention span, and on muscle tension level. The results showed that the experimental group scored significantly higher on reading comprehension skills and reduced hyperactive behavior significantly more than the control group.

TABLE OF CONTENTS

Forward..... i

Abstract..... ii

Table of Contents..... iii

List of Tables..... iv

I. INTRODUCTION..... 1

II. METHOD..... 8

Subjects..... 8

Comparison Measures..... 9

Instrumentation..... 12

Experimenters..... 13

Training..... 13

Evaluation and Assessment..... 15

III. RESULTS..... 16

Evaluation of Experimental and Control Groups..... 16

Evaluation of Control, Placebo-Control and Experimental Groups..... 18

Comparison of the Three Experimental Groups..... 19

IV. DISCUSSION..... 23

References..... 27

LIST OF TABLES

Table I..... 11

Table II..... 20

INTRODUCTION

The syndrome called "hyperactivity" is one which remains vague and ill-defined. The term is often used indiscriminately to describe a purely behavioral syndrome, as well as to classify the behavior of a child with clear organic dysfunction. Because of the lack of clarity in defining hyperactivity, it has, unfortunately, been used as a catchall for many types of troublesome behaviors in children. These behaviors include extreme restlessness, distractibility, low frustration tolerance, irritability, aggressiveness towards other children, rough play, poor peer relations, overactivity, impulsivity, and poor academic performance. Taken individually, these behaviors do not constitute a diagnosis of hyperactivity. However, when several of these characteristics are present to a significant degree (i.e., short attention span, extreme overactivity, behavioral and academic difficulties in school), then often a diagnosis of hyperactivity is considered appropriate. (Whalen and Henker, 1976)

The etiology of hyperactivity is equally as uncertain as its definition, with many varying theories vying for acceptance. Knobel (1962) associated hyperactivity with minimal brain dysfunction (MBD), and saw it as evidence of slow cortical maturation. Bower and Mercer (1975) point out the need to distinguish between organically based hyperactivity and "developmental hyperactivity (not accompanied by clear evidence of major CNS disorder or childhood psychosis)." (p. 196) Ney (1974) postulates four categories of hyperactivity, attributing the syndrome variously to: behavioral conditioning, abnormal pregnancies and/or perinatal events, genetic origins, and chaotic parental and home environments.

In spite of the lack of clear definition and etiology concerning hyperactivity, it is a diagnosis applied to 5 - 10% of school children. One of the most common methods of treating hyperactivity has been with drugs. The two types of medication prescribed are the stimulant drugs (such as amphetamines and Ritalin) and, less frequently, tranquilizers. Although positive effects upon hyperactive behavior have been reported with drug therapy, research reveals that it is not necessarily the treatment of choice; and in fact, many negative side effects may occur. Bendix (1973) cites numerous side effects occurring with the use of drugs prescribed for hyperactivity, such as: nervousness, insomnia, rashes, nausea, loss of appetite, heart palpitations, headache, change in blood pressure, irregular heart rate, heart pain, weight loss, fast pulse rates, and even hallucinations, catatonic withdrawal, and acute allergic reactions. She concludes that the evidence for the effectiveness of Ritalin or amphetamines is at best very tenuous. While perhaps decreasing overactivity, tranquilizers have been found to show an impairment of learning and cognitive functions. (Glennon and Nason, 1974) The abuse of Ritalin was so widespread in Sweden and Japan that the drug was totally banned in those countries (Bendix, 1973).

Another prevalent criticism regarding drug treatment of hyperactivity is the lack of well-controlled studies and the preponderance of inconclusive research to support its use. (Wiens, Arthur, and Matarazzo, 1972; Bendix, 1973; Appleman, 1975) Bendix (1973) notes that "most drug studies of hyperactivity have not employed good drug evaluation procedures," i.e., adequate controls, appropriate sample sizes, double blind procedures, and control for placebo effect. Wiens, et al., (1972) discuss a literature review done in 1971, showing that

where subjective measures were used, more positive results were cited in drug-treated groups. But given objective measures (clinical opinions, rating scales, psychological tests, direct behavioral measures of hyperactivity), only twenty drug studies showed objective behavior change as a result of drug therapy and fifty-seven showed no significant differences. Furthermore, even though five year follow-ups showed some changes in hyperactive behavior, a large portion of significant problems remained. The authors of the study suggested that medication be used as an adjunct to behavior modification treatment, rather than be used as the sole change agent.

Finally, the follow-ups that have been done with children receiving drug treatment for hyperactivity fail to yield very positive support for this method. In a 1973 follow-up of eighty-four children treated for behavior disorder in rural Vermont, a poor prognosis was indicated for the hyperactive child despite drug treatment. (Heussey, Metoyer, and Townsend, 1973) Wiens, et al., (1972) report that although five-year follow-ups show some changes in hyperactive behavior, a large portion of significant problems remain. Novack (1971) stated that beneficial control has resulted from medication in only 15 - 20% of populations designated as acting out. In summary, Van Olsdel and Carlson (1972) conclude that drug treatment is "one of the less effective treatment methods in the numbers of children helped, the scope of improvement, and the duration of effectiveness." (p. 24)

An alternative treatment method for hyperactivity that has been explored and is currently in use is behavior modification. Numerous studies have been done to assess the effectiveness of various types of behavioral intervention. It is possible to differentiate between two major categories of behavior modification techniques used, those

employing external control or reward systems, and those teaching internal control.

Several studies report positive results utilizing operant control, or reinforcement techniques. Reinforcement of academic performance in a study with three hyperactive, learning disabled children controlled hyperactivity to a level "comparable to that when they were on drugs." (Ayllon, 1975, p. 137) In addition, "math and reading performance for the group jumped from about 12% during baseline to a level of over 85% correct. Each child performed behaviorally and academically in an optimal manner without medication." (Ayllon, p. 137) Schofield, Hedlund, and Worland (1974) demonstrated that a behavior modification approach to group therapy with hyperactive boys (aged 8-10) resulted in increased attention to tasks, as well as more frequent interpersonal interaction.

Rosenbaum, O'Leary, and Jacob (1975) lend further support to the viability of behavioral approaches to controlling hyperactivity. In a treatment program utilizing group reward and individual reward, significant effects upon problem behavior were produced and maintained during a one-month treatment withdrawal period. The results of this study also demonstrated the fact that behavioral intervention produces changes similar to those reported with drug therapies.

Operant control can produce reductions in hyperactivity with the mentally retarded, as well as with children of normal intelligence. (Alabiso, 1975) Employing reinforcement of attention span and selective attention with institutionalized, hyperactive, retarded boys, hyperactivity and distractibility were decreased, and performance on discrimination tasks increased. Also interesting in this study is the fact that these subjects had already been receiving drug therapy, which

had not produced the same type of behavioral changes.

A second type of behavior modification technique being used in the area of hyperactivity is that of "cognitive behavior modification." (Meichenbaum, 1976) This method allows an individual to attain internal control of his or her own behavior. In this respect, it is ultimately a more effective technique than (external) operant control, since, after a period of instruction, external control is no longer needed. The responsibility for behavioral change rests entirely with the individual. Because of this aspect, cognitive behavior modification would seem to offer the best prospect for generalization from the treatment situation to the outside world (i.e., the classroom, home, etc.).

Palkes, Stewart, and Kahana (1968) used verbal mediation training to decrease hyperactivity in ten hyperactive boys. After a total of only sixty minutes over a two-day period of learning self-directed verbal commands, significant experimental-control differences resulted in overall performance on the Porteus Maze Test. Bornstein and Quevillon (1976) demonstrated significant effects on the behavior of three overactive preschool boys with the use of a self-instructional program. The dramatic increase achieved in on-task behavior and generalization give considerable credence to the usefulness of this type of training. Goodwin and Mahoney (1975) suggested the possibilities of using "covert coping self-statements" as a means of coping with aggression. Four hyperactive boys were instructed in the use of such statements, consequently improving in coping skills and classroom behavior.

Two other areas of study have become involved with hyperactivity of late; these are relaxation training and biofeedback training. They have demonstrated impact upon hyperactive behavior in many ways

similar to the impact behavior modification has had. Illovsky and Freiman (1976) recently used hypnotic suggestions - suggesting relaxation and coping abilities - with forty-eight hyperactive 6-8 year olds. They found significant correlations between the percent of relaxation with increased attention span and increased self-confidence as well. Breathing control in conjunction with biofeedback has also been used successfully to promote increased attending and self-control of distracting motor activity. (Simpson and Nelson, 1974) In her book, Stress and the Art of Biofeedback, Brown (1977) cites several studies evaluating the effectiveness of relaxation and electromyographic (EMG) biofeedback training. In a pilot study with an extremely hyperactive six year old boy, EMG (Frontalis) biofeedback training resulted in dramatic improvement "in behavior, psychological test scores, achievement tests at school, improvement in self-concept and self-esteem, and a reduction in 'psychosomatic symptomology.'" (p. 85)

The findings regarding the use of drug therapy for hyperactivity clearly point to the need for establishing a more effective treatment methodology. The possibilities of a variety of harmful side effects certainly indicate a need for extreme caution in prescribing medication for hyperactivity. Moreover, the lack of supportive research for the success of drug therapies suggests that they be used only in extreme (out of control) cases, and only then as an adjunct to other types of treatment.

The success demonstrated by behavioral, relaxation, and biofeedback techniques substantiates the need for further development of these methods with a larger population. In determining what type of "treatment package" to evaluate, the following considerations were

made for the present study. One, cognitive behavior modification was seen as the most desirable method of behavioral intervention because of the emphasis it places on internal regulation. That is, a method that places the responsibility with the individual for his/her own behavior seemed to afford the best possibility for long term success. In addition, generalization is a key factor in determining success. Thus, a technique was needed that the individual could, in essence, "carry with him." Second, since hyperactivity is a problem that occurs frequently in the school setting, the school environment was thought to be an appropriate and practical treatment setting. It was also considered appropriate in promoting generalization of the learned behaviors. Third, the treatment package itself was of utmost importance. The authors felt that it was most efficient to combine relaxation, biofeedback training, and cognitive behavior modification techniques in the interests of insuring and strengthening the treatment effect upon hyperactivity. Beyond providing a comprehensive approach, the techniques used tended to blend together quite naturally, and it was postulated that in combination they would gain in impact.

METHOD

Subjects:

The subjects in this study were 86 children, 35 fourth, 26 fifth, and 25 sixth grade children who were primarily boys (67 boys and 19 girls). The subjects attended nine different elementary schools in the La Mesa-Spring Valley School District, which is a generally middle class district, but which has a good cross section of races and economic conditions. The 86 students were further divided into regular and special education with 58 children and 28 children coming from each type of educational program respectively. The 28 special education children were children who had been primarily identified as Educationally Handicapped according to California state regulations, with three of the 28 children identified as Educable Mentally Retarded.

The subjects who participated in the project were first identified via ratings on the Conners Abbreviated Rating Scale (Conners, 1969), which had been completed by the student's teacher. A cut-off score of 15 on the Conners was taken as being indicative of hyperactive behavior. Once the students had been identified by this method, parent permission was sought and 104 children were given permission to participate in the program. Of the original 104, 86 children completed the project. Of the 18 children who dropped out of the program, three dropped out due to conflict with either the placebo-control or the experimental conditions; three were dropped due to conflicts in time schedules, and twelve moved either out of the district or to schools that were not participating in the project.

The children who participated in the project were placed into one

of three conditions, control, placebo-control, or experimental, by a stratified random sampling procedure. Thirty-two children made up the control group, twenty-two regular education, and ten special education children. Twenty-eight children composed the placebo-control group, twenty regular, and eight special education, and twenty-six children were in the experimental group, fifteen regular and eleven special education. The experimental group of twenty-six subjects was further divided into three experimental conditions (described in the training section) through a random selection process, resulting in a breakdown of six children in group A, ten in group B, and ten in group C.

Comparison Measures:

Seven different general factors were examined in this project. As a result, each general area had a minimum of one measure while several had more than one measure. The first factor that was explored was the subject's level of hyperactivity. Two measures were used in evaluating this factor. The first was the Conners Abbreviated Rating Scale (Conners, 1969). This scale consists of ten questions or statements about behavior that the teacher rates from "occurring not at all" to "occurring very often." This scale has been a very popular method for evaluating hyperactivity and has shown itself to be drug sensitive (Whalen and Henker, 1976). The second method of measuring hyperactivity was a behavioral procedure, which rated a child's behavior as to its appropriateness and attentiveness during repeated ten-second observation periods (Meichenbaum, Bowers, and Ross, 1968). In this approach the subject was observed for two 10-minute periods, and sixty different ratings were made in broad categories of "appropriate" or "non-appropriate." Appropriate behavior was defined as any behavior which was not consistent with the task assigned by the teacher, that is, behaviors that

were not task specific.

The second factor that was evaluated in this project was the muscle tension levels of the children. This measure was established by taking five 15-second ratings on an electromyograph, recording these, and then taking the average of the five separate ratings. The third factor that was evaluated was that of attention span. Because of the strong interest in this area in relationship to hyperactivity, two measures were used. The first measure used was the Children's Checking Task (Margolis and Keogh, 1974). In this task, the subject listens to a tape on which a series of numbers are presented orally. As the numbers are being stated, the child has been directed to check the similarity between what is being said and a series of printed numbers that the child has been given. If there is a discrepancy between the number being narrated and the printed number, the child is directed to circle this discrepancy. The second task used for measuring the attention of the children was the Matching Familiar Figures Test (Kagan, 1965). In this test, the subject is presented with a stimulus picture and six similar drawings. The child is directed to point out the drawing that is identical to the stimulus picture. If the child chooses the incorrect drawing, he is directed to find the correct one. From this task two measures are drawn; latency to first choice and the number of errors.

The fourth factor to be examined was termed cognitive integration and is best typified by the measures used to evaluate it. These measures consisted of the digit span, coding, and the mazes of the Wechsler Intelligence Scale for Children - Revised (Wechsler, 1974) commonly termed the WISC-R. The fifth factor examined was a measure of control or personal responsibility. The scale used was the Intellectual

TABLE I

Factors and Measurements

FACTOR	MEASUREMENT
1. Hyperactivity	Behavior Rating Scale Conners Abbreviated Rating Scale
2. Muscle Tension Level	Myographic Recording
3. Attention Span	Children's Checking Task Matching Familiar Figures
4. Cognitive Integration	WISC-R Subtests: Coding, Digit Span, Mazes
5. Social Dimensions	Intellectual Achivement Responsibility
6. Sensorimotor Function	Sensorimotor Test
7. Academic	Peabody Individual Achievement Test Reading Comprehension Mathematics

Achievement Responsibility Scale (Crandall, Katkovsky, and Crandall, 1965). This measure consists of thirty-four forced choice items designed to determine the degree to which a student believes that the intellectual failures and successes he encounters are a result of his own behavior versus the behavior of important others that are in his environment (e.g., teachers, parents, friends). These items force the child to choose between an outcome that is attributable to: a) an internal attribution, in which responsibility for the outcome is assumed by the subject; and b) an external attribution in which the responsibility for the outcome is relegated to some property of the situation or the person.

The sixth factor to be evaluated was that of sensorimotor skill. The assessment battery for this area consisted of eight different evaluations and appears as Appendix A. It was devised to provide an overall evaluation of sensorimotor functioning and to reflect changes in general physical well-being (Zasueta, 1977). The seventh and final factor to be evaluated was the academic achievement of the participants. This was accomplished through the administration of the mathematics and the reading comprehension subtests of the Peabody Individual Achievement Test (Dunne and Markwardt, 1970). These six different factors and their measures appear in Table I.

Instrumentation:

The instruments that were used with the children in the placebo-control group consisted of normal physical education supplies; such as, jump ropes, stop watches, basketballs, etc. In the experimental condition, two major instruments were used, an electromyograph and a digital integrator. The electromyograph was a miniaturized electro-myographic biofeedback device employing stainless steel electrodes and feeding the resultant signal through a 200-1000 Hz. bandwidth

filter. The biofeedback signal was visualized through a micro-voltage meter and the signal was presented auditorily through a speaker. The digital integrator provided additional visual mode information, which represented the biofeedback signal from the average of the EMG analog signal and displayed integers.

Experimenters:

The experimenters were composed of two groups. The first group consisted of three females and one male who were all graduate students in psychology or counseling. This group received instruction in the training procedures and in evaluation procedures. This group also carried out the training that was done with the subjects. Because of their dual role as evaluators and as trainers, care was taken to insure that experimenters who trained individuals did not assess them during the post testing time. The second group of experimenters were trained solely in evaluation skills and participated primarily in the pre and post testing programs. This group consisted of four females who were primarily college graduates and are currently mothers at home with children.

Training:

Both the placebo-control and the experimental groups received twelve one-half hour sessions with an E. The placebo-control group met with E in pairs and carried out the training sessions. These sessions focused primarily on physical education activities and every session worked on different activities and experiences. These tasks were designed to avoid competitive impulses between children and were aimed at developing individual skills in visual perception, large muscle control, development of trust, awareness of time intervals, and other appropriate experiences. A summary of these activities is presented in appendix B.

The experimental group which met individually with E was divided into three different treatment plans. In the first group, termed Group A, the major focus was on progressive relaxation and autogenic statements. The children in this group were exposed to relaxation that was facilitated via oral methods, and had no experience on the EMG. The second group, Group B, received both progressive relaxation, autogenic training, and EMG training. This group was thereby exposed to the more traditional approach to relaxation and relaxation facilitated by EMG. Finally, Group C, the third group, was exposed to relaxation that was facilitated only by EMG and did not learn progressive relaxation nor autogenic training.

Running throughout all three groups was a common thread of training called cognitive behavior modification (Meichenbaum, 1976). This approach assumes that a person's behavior is a function of what he thinks about what is occurring around him. If one can modify the pattern or the thoughts one is using, then one can modify the behavior. In this project, a specific package developed by Bonnie Camp (1975), which is called the "Think Aloud" procedure, was adapted for usage with fourth through sixth graders. The specific twelve-session outline is presented in Appendix C, but in general, this procedure attempts to interject between a person's perception of an action and his reaction to this stimuli, a four-step cognitive strategy. This strategy is basically: a) what is my problem or what is occurring now; b) what is my plan or what is the most productive method for dealing with this stimuli; c) am I following my plan - which is a method for evaluating ongoing behavior to determine if action is appropriate to the stimuli; and d) how did I do - which is a self-rewarding or congratulatory statement that the child uses when he has successfully completed a task.

This procedure was implemented at first using concrete examples and walking the individual through as advised in the Camp (1975) manual. However, as the sessions went on and the materials in the manual were utilized, the specific strategies were applied to visualizations that were developed within the project. Because of the unique nature of every individual in the program, general visualization strategies were given (example in Appendix D), but the E's were instructed to attempt to make these visualizations appropriate to each subject.

Evaluation and Assessment:

The pretesting was conducted over a five week period from the beginning of February, 1977 and ending in the second week of March, 1977. The post testing was begun in the beginning of May, 1977 and was completed during the second week of June, 1977. The tests in the series were administered in a random order and several tests, the CCT, the MFF, sections of the WISC-R and the IAR, were administered in groups to expedite testing time. The remaining tests were administered individually.

RESULTS

Evaluation of Experimental and Control Groups:

The effects of the treatment package were evaluated through a one-way analysis of variance, using the Statistical Package for the Social Sciences Program, ANOVA (Nye, et al., 1975). In this analysis, the post test score was used as the dependent variable and the pretest score was used as a covariate. This analysis allowed a breakdown of the treatment effect into the effect of the covariate and the main effect. In addition, adjusted cell means were a part of the output.

The analysis of the two measures of hyperactivity, (the Connors Abbreviated Rating Scale (Connors) and the Behavior Rating Scale (BRS), for the experimental and control groups revealed a significant effect on the Connors Rating Scale ($F=5.66$, $df=1,55$, $p=.02$), but a nonsignificant effect was measured by the Behavior Rating Scale ($F=.427$, $df=1,55$, $p=.99$). An examination of the adjusted means for the two groups indicates that the experimental group was rated less hyperactive ($\bar{x}=16.2$) than the control group ($\bar{x}=19.8$) on the Conners Scale.

The reading comprehension and math computation subtests of the Peabody Individual Achievement Test (Dunne and Markwardt, 1970) were utilized to assess the effects of treatment upon academic achievement. The analysis of the reading comprehension subtests demonstrated a significant effect ($F=6.20$, $df=1,55$, $p=.015$), while the analysis of the math computation subtest did not reach significance ($F=.022$, $df=1,55$, $p=.99$). Further analysis of the cell means on the reading comprehension subtests shows that the experimental group averaged significantly higher than the control group ($\bar{x}=46.02$ for the experimental group and $\bar{x}=40.62$ for the control group). The difference in

raw scores between the two groups is equivalent to approximately 1.3 years in grade level.

An area of great interest in the control of hyperactivity is that of attention (Margolis, 1972). To examine the effect of the treatment in this area, two measures of attention were used. These were the Children's Checking Task (CCT) (Margolis, Keogh, 1974) and the Matching Familiar Figures Test (MFF) (Kagan, 1975). Results of the analysis of the Children's Checking Task for the two groups indicate no significant differences between them ($F=.870$, $df=1,55$, $p=.99$). However, the Matching Familiar Figures Test, which can be broken down into results for the number of errors and for response latency, does show some interesting differences. In the area of number of errors, the two groups did not differ significantly ($F=0.143$, $df=1,55$, $p=0.99$). However, the two groups showed greater differences in latency scores ($F=2.66$, $df=1,55$, $p=0.105$). A review of the cell means indicated that the control group took longer to respond ($\bar{x}=165.22$ seconds) than did the experimental groups ($\bar{x}=131.31$ seconds).

Of comparable value in the study of hyperactivity are the areas of cognitive integration and memory skills. To investigate these areas, three subtests of the Wechsler Intelligence Scale for Children - Revised (Wechsler, 1974) were used. These were the digit span, mazes, and coding subtests. However, none of the three areas demonstrated any significant differences between the two groups (digit span: $F=1.49$, $df=1,55$, $p=.23$; mazes: $F=0.0043$, $df=1,55$, $p=.99$; coding: $F=0.104$, $df=1,55$, $p=0.99$).

Another area of importance to the study of hyperactive children is the effect hyperactivity has upon the social dimensions of behavior. Of particular relevance is the child's perception of

"locus of control," or the allocation of responsibility for any given outcome. To examine the locus of control in these children, the Intellectual Achievement Responsibility Scale (Crandall, Katkovsky, and Crandall, 1965) was administered to all children. Evaluation of these results indicate that the control group attributed their skills to their own ability significantly more than did the experimental group ($F=5.29$, $df=1,55$, $p=0.02$). Cell means for the two groups were 24.05 for the control group and 22.72 for the experimental group.

Finally, the aspect of muscle tension level was evaluated by the use of an electromyograph (EMG). Mean frontalis EMG ratings were compared for the control and experimental groups. Analysis of the scores of the two groups indicates that they did not differ significantly in their mean EMG recordings, or level of frontalis muscle tension. ($F=0.565$, $df=1,55$, $p=0.99$).

Evaluation of Control, Placebo-Control and Experimental Groups:

In this study, three groups were used to evaluate the different hypotheses. Of major concern was the rated hyperactivity level of the three groups. Analysis of the Connors Abbreviated Rating Scale and the Behavior Rating Scale indicate that there is a significant difference for the groups on the Connors (F 4.07, $df=2,82$, $p=0.02$), but no significant difference on the Behavior Rating Scale ($F=0.73$, $df=2.82$, $p=0.99$). Further examination of the adjusted cell means indicates that the control group was rated as more hyperactive ($\bar{x}=19.84$) than either the placebo-control group ($\bar{x}=16.36$) or the experimental group ($\bar{x}=16.47$). The differences between the placebo-control group and the experimental group are small and appear non-significant.

Since the placebo-control group received training in sensorimotor skills (Zasueta, 1977), evaluation of sensorimotor functioning for the three groups was also of primary concern. Sensorimotor functioning was evaluated on a variety of different measures, such as, heart rate, side-steps completed in a one-minute period, and the ability to follow a series of instructions for physical movement (run, hop, skip, jump). The results of the eight physical performance measures, which appear in Table II, reflect no significant differences between the three groups. However, two of the eight areas approached significance. One of these areas, pulse rate before stepping up and down, indicates that the placebo-control group had a higher pulse rate ($F=2.37$, $df=2,82$, $p=0.098$) than either the control or experimental group. Reflective of this difference, the placebo-control group had an average pulse rate of 74.07, while the experimental and control groups were much higher ($\bar{x}=80.64$ and 77.11 respectively). The other area approaching significance ("How slow can you go?") focused on slowness in a large muscle coordination task. On this task, the experimental group performed at a much slower rate than the other two groups ($F=2.37$, $df=2,82$, $p=0.078$). Means for the three groups were: Experimental, 51.2 seconds, Control, 41.2 seconds, and Placebo-Control, 36.2 seconds. These results suggest that the experimental group did move more slowly than the other two groups and, therefore, appeared to be in better control.

Comparison of the Three Experimental Groups:

In this project, the experimental group was broken down into three similar subgroups. Accordingly, the results from the various measures were analyzed to determine if any significant differences

TABLE II

Summary of Analyses of Covariance for the Sensorimotor Components For the Control, Placebo-Control and the Experimental Groups

Subtest	F	Probability
1. How slow can you go?	2.37	0.078
2. a. Pulse recovery immediately	2.369	0.098
b. Pulse recovery after 1 minute	0.073	0.999
c. Pulse recovery after 3 minutes	0.014	0.999
3. Mirror Image	1.564	0.214
4. a. Following three directions	1.334	0.268
b. Following six directions	0.498	0.999
5. Side Stepping	0.741	0.999

occurred between these subgroups. Of great interest were the differences in rated hyperactivity between the three groups. Scrutinizing the Connors Rating Scale for differences between the groups through the analysis of covariance reveals significant differences ($F=11.71$, $df=2,22$, $p=0.001$). Further examination of the adjusted cell means demonstrates that group C, which received biofeedback and "think aloud" training, was rated the least hyperactive ($\bar{x}=13.11$) among the three subgroups. Group A was rated next less hyperactive ($\bar{x}=14.02$), and group B was rated the most hyperactive ($\bar{x}=20.29$).

Similarly, in examining the results in the area of attention a significant difference occurs between the three groups on the MFF Scale for number of errors ($F=3.63$, $df=2,22$, $p=0.04$). Adjusted cell means show that group C made fewer errors ($\bar{x}=5.5$) with group A making the next least amount of errors ($\bar{x}=9.10$) and group B making the most ($\bar{x}=9.14$). Significant differences also appear on the IAR Scale ($F=9.51$, $df=2,22$, $p=.001$). Once again, examination of the cell means indicated that group C scored much lower on total score ($\bar{x}=20.55$) than group B ($\bar{x}=22.86$) or group A ($\bar{x}=27.31$).

Review of academic achievement of the three groups reveals a difference in the math computation subtest of the PIAT. The level of significance does not reach .05, but does indicate that the three groups performed differently ($F=2.75$, $df=2,22$, $p=.09$). Contrary to earlier results in which group C outperformed the other two groups, on this measure group B scored higher ($\bar{x}=45.66$ for group B, 44.06 for group C and 39.79 for group A).

One surprising result is that the three groups did not differ in their EMG scores ($F=0.673$, $df=2,22$, $p=0.99$). This is especially

interesting because group A was exposed to the EMG units only at pre and post test times, while the other two groups received EMG training during all twelve treatment sessions.

DISCUSSION

The purpose of this study was to answer the question, "Can hyperactive children learn to control their behavior in the regular educational setting through the development of cognitive awareness and the utilization of their own physiological feedback systems?" The answer to this question, as indicated by the results of this project, appears to be yes.

The experimental group did reduce hyperactivity levels to a greater degree than the control group, as measured by the Connors Abbreviated Rating Scale. Although a similar effect was not demonstrated on the Behavior Rating Scale, the validity of the Behavior Rating Scale tended to correlate very little with the Connors. In addition, Whalen and Henker (1976) report that a rating scale such as the Connors is a much more reliable method for evaluating hyperactivity than behavioral ratings, such as the Behavior Rating Scale. Comparatively, the placebo-control group was also rated significantly below the control group on the Connors, and apparently demonstrated a reduction in hyperactivity. The similarities between the placebo-control and experimental groups in reducing hyperactive behavior are difficult to comprehend. However, the experimental group surpassed the placebo-control group in other major areas of evaluation. This would suggest that the treatment received by the experimental group had a much wider range of effect than that shown by the placebo-control group.

There were other areas of great importance that reflected the impact of the treatment. One of these areas was that of reading comprehension. Here, the experimental group not only significantly

surpassed the control group in correct scores, but actually averaged one year and three months ahead of the control group in reading skills at the conclusion of the study. This gain in reading comprehension skills was the result of a six-week treatment period. Further analysis, although not reported here, demonstrated that the experimental group also outachieved the placebo-control group in this area. The fact that teaching children control of hyperactivity through relaxation and cognitive procedures has an impact upon reading achievement certainly demonstrated the generalization of these strategies to the classroom. Generalization beyond the treatment situation was also given further support by the results of teacher ratings of hyperactivity. Perhaps most importantly, these are changes that have been produced through an educational experience, and ones that are internally controlled by the individual child himself. The efficiency of such a treatment procedure for the educational sphere is indicated by the relatively short period of training needed for a child to become self-regulating. Another important finding was the ease in which personnel can be trained in the treatment procedures. The trainers used in this project received a very brief in-service program and were able to apply these strategies successfully to both regular and special education students. Considering the facility with which this was done, it is evident that this method may be easily learned and implemented by resource teachers and other school personnel, including para-professionals or volunteers. The relatively short instruction time required demonstrates that it can easily be integrated into the regular school curriculum.

Two areas of evaluation revealed unexpected differences. On the MFF, the experimental group did not increase their latency, or

response time, which is generally related also to response accuracy. However, they were still able to perform at an equal level of accuracy to the two other groups, while taking less time to respond. This suggests that the treatment package did have some effect upon attentional mechanisms as related to response accuracy. The fact that accuracy was maintained, and not impaired indicates that these attentional processes may be enhanced by cognitive strategies while changing response latency times.

The second measure which yielded an unexpected result was the IAR Scale. In this area, the treatment package was expected to increase internal attribution of responsibility. However, this did not happen. The experimental group revealed a more external orientation in spite of the treatment than did the control group. These findings indicate a need for further research and examination.

In this study, the placebo-control group was expected to surpass the other two groups in physical performance ratings, since they received twelve sessions of sensorimotor training. However, this expected outcome was only demonstrated on one of the eight measures. As mentioned before, this was the relatively unimportant area of pulse rate after a stepping task. Considering these relatively negative results, it would appear that the sensorimotor training used was an ineffectual method to improve the skills measured by this battery of tests.

A result found by the sensorimotor evaluation that was contrary to the original hypotheses, but supportive of the treatment package, was the experimental group's gain in control of motor movement. They exhibited a significantly greater ability to produce slower gross motor movement than did either the placebo-control or the control groups.

This result suggests that the experimental group had learned a new cognitive style, which could be successfully applied to physical tasks as well as academic ones. Furthermore, the ability to "slow down" or control one's movements is of no doubt important in changing hyperactive behavior.

The results of this project support the viability of the treatment package utilized as an effective method of teaching self-control of hyperactivity. While some of the data did not meet projected expectations, the hypotheses that were supported constitute major findings in the study of hyperactivity. The treatment package developed and used in this project has proven itself to be a viable alternative to other methods used to control hyperactivity. It not only provides the school system and all professionals concerned with hyperactive children with an alternative to drug control, but it is an alternative free of the possible harmful side effects that have been noted with medication. This method of internal behavioral regulation is comparable in effect to the more well known and used externally operated systems. We (the authors) feel that this is of particular significance in relation to the generalization of treatment effects. The treatment package used in this study is at least as effective as both drug therapies and external behavior modification methods in terms of short-term effects. But beyond this, the success of the children in internalizing control of their hyperactive behavior indicates that it offers far better possibilities for long-term success as well.

REFERENCES

Alabiso, F. Operant control of attention behavior: A treatment for hyperactivity. Behavior Therapy, 1975 Jan., 6(1) 39-42.

Appleman, M. A. The legal issues involved in the use of stimulants on hyperactive school children. Dissertation Abstracts International, 1975, 35(8-A), 5161.

Ayllon, T. and Others. A behavioral-educational alternative to drug control of hyperactive children. Journal of Applied Behavioral Analysis, sum 1975, 8; 2; 137-46.

Bendix, S. Drug modification of children: A form of chemical violence against children? Journal of Clinical Child Psychology, 1973, 2(3), 17-19.

Bornstein, P.H. and Quevillon, R. P. The effects of a self-instructional package on overactive preschool boys. Journal of Applied Behavioral Analysis, 1976 sum, 9(2), 179-188.

Bower, K. B. and Mercer, C. D. Hyperactivity: Etiology and intervention techniques. Journal of School Health, 1975, 45(4), 195-202.

Brown, B. B. Stress and the Art of Biofeedback, New York: Harper and Row, 1977.

Camp, B. W. and Bash, M. A. Think Aloud Program: Group Manual University of Colorado Medical School, Denver, Colorado, 1975.

Conners, C. K. A teacher rating scale for use in drug studies with children. American Journal of Psychiatry 126; 884, 1969.

Crandall, V. C., Katkovsky, W., and Crandall, V. J. Children's beliefs in their own control of reinforcement in intellectual-academic achievement situations. Child Development, 1965, 36, 91-109.

Dunn, L. M. and Markwardt, F. C. Peabody Individual Achievement Test, Minnesota: American Guidance Service, Inc., 1970.

Glennon, C. A. and Nason, D. E. Managing the behavior of the hyperkinetic child: what research says. Reading Teacher, 1974, 27(8), 815-824.

Goodwin, S. E. and Mahoney, M. J. Modification of aggression through modeling: An experimental probe. Journal of Behavior Therapy and Experimental Psychiatry, 1975 Oct., 6(3), 200-202.

Huessey, H. R., Metoyer, M., and Townsend, M. 8-10 year follow-up of 84 children treated for behavior disorder in rural Vermont. Paper read at the 50th anniversary annual meeting of the American Orthopsychiatry Association, May 29 - June 1, 1973.

Illovsky, J. and Fredman, N. Group suggestions in learning disabilities of primary grade children: a feasibility study. International Journal of Clinical and Experimental Hypnosis, 1976 April, 24(2), 87-97.

Kagan, J. Reflection-impulsivity and reading ability in primary grade children. Child Development, 1965, 36, 609-628.

Margolis, J. S., and Keogh, B. K. School achievement and the ability to maintain attention to task: A vigilance model applied to school learnings. Paper presented at the Western Psychological Association, San Bernardino, California, April, 1974.

Meichenbaum, D. Cognitive-Behavior Modification Newsletter, April, 1976, University of Waterloo.

Meichenbaum, D. H., Bowers, L. H., and Ross, C. O. Observing children's behavior: an objective method. Child Development, 1968, 38, 90-100.

Meichenbaum, D. H. and Goodman, J. Training impulsive children to talk to themselves. Journal of Abnormal Psychology, 1971, 77, 2, 115-126.

Ney, P. G. Four types of hyperkinesis. Canadian Psychiatric Association Journal, 1974, 19(6), 543-550.

Nie, N. H., Hull, C. H., Jenkins, J. G., Steinbrewner, K., and Bent, D. H. Statistical Package for the Social Sciences: SPSS, New York: McGraw-Hill, 1975.

Novack, H. S. An educator's view of medication and classroom behavior. Journal of Learning Disabilities, 1971, 4, 507-508.

Palkes, H., Stewart, M., and Kanana, B. Porteus maze performance of hyperactive boys after training in self-directed verbal commands. Child Development, 1968, 39, 817-826.

Rosenbaum, A., O'Leary, K. D., and Jacob, R. G. Behavioral intervention with hyperactive children: Group consequences as a supplement to individual contingencies. Behavior Therapy, 1975 May, 6(3), 315-323.

Schofield, L. J., Hedlund, C., and Worland, J. Operant approaches to group therapy and effects on sociometric status. Psychological Reports, 1974 Aug., 35(1, pt. 1) 83-90.

Simpson, D. D. and Nelson, A. E. Attention training through breathing control to modify hyperactivity. Journal of Learning Disabilities, 1974 May, 7(5), 274-283.

Van Ohdol, B. M. and Carlson, L. A study of developmental hyperactivity. Mental Retardation, 1972 June, 10(3), 18-24.

Wechsler, D. Manual for the Wechsler Intelligence Scale for Children - Revised, 1974, New York, The Psychological Corporation.

Whalen, C. K. and Henker, B., Psychostimulants and children: A review and analysis. Psychological Bulletin, 1976, 83(6), 1113-1130.

Wiens, A. N., Anderson, K. A., and Matarazzo, R. G. Use of medication as an adjunct in the modification of behavior in the pediatric psychology setting. Professional Psychology, 1972, 3(2), 157-163.

Zasueta, A. Personal communication, 1977.

APPENDIX A

Sensorimotor Scoring Sheet

SCORING SHEET

Name _____

School _____ Date _____ Age _____ Class _____

Test	Scoring	Comments
How Slow Can You Move: (min/sec.)		
Going Down		
Coming Up		
Pulse Recovery: (Heartbeats)		
Resting		
Post Stepping 1 minute		
3 minute recovery		
Mirror Image: (timed for 2 min.)		
Trainer Leads		
Subject Leads		
Body Image: (picture)		
Sequential Movements: (score)		

First Series:	walk	run	skip	run		
Second Series:	walk	run	walk	jump	hop	walk

(1 pt. for completion: 0 for N/comp.)

Side Step: (10 sec.)		

Comments:

aq
1/77

APPENDIX B

Summary of Sensorimotor Training

	Object	Activity
Day 1	Sequencing and recall	How fast/slow can you go?
Day 2	Sequencing and recall	Card Relay
Day 3	Experience tactically	Trust walk
Day 4	Conceptualization of time	Trust walk estimating time
Day 5	Experience kinesthetically	Pretending to be ...
Day 6	Visual perception	Rope activities
Day 7	Coordination	Obstacle course
Day 8	Creativity and imagination	Create mental pictures of objects
Day 9	Taste discrimination	Tasting different materials
Day 10	Tactile, aural discrimination	Working on outdoor gym
Day 11	Visual and tactual senses	Kicking and dribbling soccer balls
Day 12	Aural discrimination	Dancing

APPENDIX C

Outline of Experimental Training Sessions

TRAINING SCHEDULE - GROUP III

30 Min.	III-A 1. Relaxation Training 2. Other	III-B 1. Relaxation Training 2. Other 3. BFT	III-C 1. Other 2. BFT
1	1. Copy Cat 2. Teach Breathing 3. Think Aloud	1. Copy Cat 2. Teach Breathing 3. Add EMG 4. Think Aloud	1. Copy Cat 2. Teach EMG 3. Think Aloud
2	1. Think Aloud procedure to teach Jacobsen's 2. If time, puzzle ex.	1. Think Aloud procedure to teach Jacobsen's on EMG 2. If time, puzzle	1. Review EMG according to Think Aloud 2. Puzzle exercise
3	1. Review Jacobsen's with Think Aloud. 2. Use T.A. for problem solving 3. If time, Auditory Association	1. Review Jacobsen's with T.A. on EMG. 2. Problem solving w/T.A. 3. If time, Auditory Association	1. Review & Practice EMG with T.A. 2. Problem solving w/T.A. 3. Auditory Association
4	1. Practice relaxing and Think Aloud 2. Identifying Emotions	1. Practice relaxing and Think Aloud on EMG 2. Identifying Emotions	1. Practice Think Aloud with EMG 2. Identifying Emotions
5	1. Teach Autogenic ex., using T.A. 2. Auditory Assn. # 2 3. If time, visualization	1. Teach Autogenic ex. using T.A. Then do ex. on EMG 2. Auditory Assn. # 2 3. If time, visualization	1. Practice EMG with Think Aloud 2. Auditory Assn. # 2 3. Visualization
6	1. Review Autogenic with T.A. 2.	1. Review Autogenic with T.A. & EMG. 2.	1. Practice EMG with T.A. 2.
7	1. Practice relaxing with T.A. 2. Identifying pictures 3. If time, visualization	1. Practice relaxing and EMG with T.A. 2. Identifying pictures 3. If time, visualization	1. Practice EMG with T.A. 2. Identifying pictures 3. If time, visualization
8	1. Practice relaxing 2. Mazes 3. If time, social task	1. Practice relax. & EMG 2. Mazes 3. If time, social task	1. Practice EMG 2. Mazes 3. Social task
9	1. Practice relaxing 2. Auditory Incong. I	1. Practice relaxing on EMG 2. Auditory Incong. I	1. Practice EMG 2. Auditory Incong. I
10	1. Practice relaxing 2. Auditory Incong. II	1. Practice relax. on EMG 2. Auditory Incong. II	1. Practice EMG 2. Auditory Incong. II
11	1. Practice relaxing 2. Visualization 3. Simulation	1. Practice relax. on EMG 2. Visualization 3. Simulation	1. Practice EMG 2. Visualization 3. Simulation
12	1. Practice relaxing 2. Visualization 3. Simulation	1. Practice relax. on EMG 2. Visualization 3. Simulation	1. Practice EMG 2. Visualization 3. Simulation
N =	16	8	8

APPENDIX D

Training Materials

BREATHING EXERCISE

Normally we breathe in two parts. We inhale and then exhale. We spend about half of our time doing each. I want you to try a different way of breathing, a way to use when you want to relax.

To do this breathing, you are going to breathe in five parts instead of two. First, inhale a little more quickly than normal - like this (demonstrate). Then, very slowly, (2) start to exhale, (3) continue to exhale, (4) finish exhaling, (5) then rest. (Demonstrate entire pattern.) When you need to breathe again, inhale and start the process over. Notice how you feel when you breathe this way. Notice any feelings of relaxation you feel when doing this breathing.

To make sure you are doing this breathing correctly, place your hand on your stomach as you breathe. Your stomach should go out when you inhale, and back in when you exhale.

aq

PROGRESSIVE RELAXATION

Today we're going to do an exercise that will help you become more aware of when you are tense or when you're relaxed. It will also help you learn how to relax your muscles better.

To do this, we are going to tighten, or tense a muscle first, then relax it. Like this - (demonstrate, making a fist, then relaxing it). You try that now; make a fist, tighten it, feel the tension, then relax it. Notice how it feels to relax it. Now make a fist with the other hand, relax it....etc.

EXCERCISES:

1. Fingers--make a fist
2. Wrist--bend hand back toward head
3. Biceps--tighten
4. Toes--curl under; do not cramp
5. Ankle--bend foot back toward head
6. Lower leg extender--straighten out leg, tighten muscles in thigh
7. Anal aphincter and buttocks
8. Stomach--firm stomach as if someone is going to tap you lightly
9. Shoulders--shrug up to ears

10A. Neck--imagine there is a figure 8 (∞) in front of your eyes and follow it around making it larger and larger until chin is over shoulders. Then follow the figure 8 around the other way.

10B. Neck--after warming up gradually:
bend head forward, then return to normal position
bend head back, then return to normal position
bend head to the left, then return to normal position
bend head to the right, then return to normal position

11. Jaw--yawn slowly
12. Tongue--press against roof of mouth

13A.. Eyes--squint or close tightly

13B. Eyes--without moving head:
move eyes up, then return to normal position
move eyes down, then return to normal position
move eyes to the left, return to normal position
move eyes to the right, return to normal position

Now we're going to go through the exercises again and add the breathing to them. Remember that when you inhale, you are tensing, and when you exhale, you are relaxing. So, this time, when you tense a muscle, you'll inhale, and as you let the air out, or exhale, you relax the muscle. Like this - (demonstrate, do entire fist exercise). Now before you go on to the wrist exercise, just take a minute and breathe a few times. Do the breathing between each of the different exercises. Notice how much more relaxing that is.

The more you practice this exercise, the more you will be able to relax your muscles by just doing the breathing and thinking about them, without tensing them first.

(Talk about practicing at home)

AUTOGENIC HEAVINESS EXERCISE

Today I'm going to teach you another relaxation exercise. First of all I want you to rest your arms at your sides, lean back in your chair, and stretch your legs out in front of you. Try to relax all of your muscles so that you will be comfortable.

I'm going to be saying some phrases to you like: "My right arm is heavy," "My left arm is heavy," etc. It does not matter if you feel heavy or not. You might feel heavier, or lighter. You might even feel warm or a tingling in your hands or feet. Or, you might not feel anything. This doesn't matter. You should simply listen to the phrases and notice whatever feelings you have as you're listening.

In a moment, I'm going to have you close your eyes and listen to the phrases. At the end of this exercise, I will say: "Now terminate slowly." When you hear me say this, you should flex your arms (like this), take a deep breath, and open your eyes. (Demonstrate.)

Now close your eyes, make sure your arms and legs are uncrossed and relaxed, and just listen to what I'm saying.

"My right arm is heavy...repeat
(repeat each phrase three times, slowly,
pause briefly between each phrase).
My left arm is heavy...
Both my arms are heavy
My right leg is heavy
My left leg is heavy
Both my legs are heavy
My arms and legs are heavy.

Now terminate slowly. Flex your arms, take a deep breath and open your eyes.

Was everything comfortable? What did you feel?

Let's try that again. Close your eyes, and listen to what I'm saying.

REPEAT EXERCISE

Now I would like you to try this exercise on your own. "Say" the phrases to yourself silently - just think them - just as I said them to you. When you have finished "Saying" them, terminate the exercise.

(Ask what they feel at end of exercise.)

Now we're going to have you try that on the machine.

(* Make sure they do their normal breathing with this exercise - they shouldn't try to concentrate on their breathing at the same time they are doing this exercise.)

aq

Beginning Visualizations

1. It is very early in the morning as you wake up. You feel nice and warm under the covers. It is very quiet in the house, so quiet you know that no one else is up yet. You are the only one awake. You can almost "hear" the quiet. It is so peaceful. And you feel very cozy in bed, just listening to how quiet it is.....
   Variation: You wake up to hear it raining softly on the roof. It looks cold and wet outside. Inside you are nice and dry and warm under the covers..... etc.

2. You're lying on the beach, warm under the sun. The sand feels nice and soft underneath you. You're very calm and relaxed, almost falling asleep. You can hear the waves rolling in, gently. You feel so comfortable.....
   Variation: (i.e. if beach inappropriate) You're lying on the grass in the park. The sun makes you feel nice and warm, and comfortable, sort of sleepy. You can hear the birds in the trees. You can hear the soft rustling of leaves in the trees and feel a light breeze, making it relaxing and comfortable.....etc.

3. You are walking slowly through a beautiful green forest. The only sounds you can hear are the sounds of birds in the distance. It is very quiet here and you continue to walk slowly and quietly, enjoying the calm and peacefulness. It is a warm day but the forest is slightly cool, making you feel very comfortable, just the right temperature. You have the forest all to yourself with nothing to disturb you, just feeling good, feeling calm and relaxed.....

4. You are sitting on a bank at the side of a lake. The water is very still and quite clear. The lake is flat and shiny. If you look into the distance you can see the water sparkling from the sun shining on it. It is very comfortable where you're sitting and you find it so easy to relax just gazing out at the lake.
   Variation: It is summer time and nice and warm out. You are just about to go into the water (i.e. pool or lake) with your raft. You slide into the cool, calm water and then onto your raft. You lie on your back on the raft and just float there. You let your arms and legs dangle in the cool water as you're floating. You relax completely just letting your raft hold you up. It is very comfortable. You lie that way for a long time, feeling relaxed.....

aq

Visualizations in the Classroom

1. You are sitting in your seat, listening to the noises in the classroom. You can hear somebody shuffling their feet next to you. You hear the teacher writing on the blackboard, the chalk clicking as they're writing. Somebody coughs. You can hear someone else flipping pages in a book. As you are listening to the sounds you are calm and feeling comfortable, very relaxed. You're paying attention to the noises, but you still feel comfortable and relaxed. I wonder if you'll notice today how comfortable you can feel when you're sitting quietly in your seat in class. That you can feel just as relaxed with the sounds in the classroom as you do here, where it's quiet.

2. (Pre-requisite: #1)
You're sitting in your seat, feeling comfortable and relaxed. _____ gives out an assignment to the class. What do you do now? You listen to what _____ is saying. You feel calm about this because you know what you have to do. You start thinking, what am I supposed to do? You know which book to take out and which page to go to. So you do just that. You work on your assignment, feeling relaxed. There are noises in the classroom, and some of the other kids are walking around instead of working. You notice them, but you go on and finish your work. How did you do? You followed your plan and finished the assignment. Good, you did what was asked, and you know you did well.

3. CONFLICT SITUATIONS
   A. You're sitting in your seat in class. Somebody walks by and bumps you hard. They bumped your arm so hard that you accidentally drew a big line across the paper you were writing on. In fact it even tore the paper a little. The person who bumped you doesn't even stop to apologize. They just keep on walking. What do you feel like? What do you do about it? (Have child respond verbally to this. If response is inappropriate/negative, ask child - "What other way could you do that?" Use think aloud strategies to problem-solve).

   B. _____ gives out an assignment to the class and asks everyone to work at their seats. Instead of doing this, you start moving around and getting out of your seat. What do you think will happen? What will _____ say? (or, if particular teacher wouldn't say anything, what would most teachers say or do?) Use think aloud to resolve the situation.

   C. Today _____ is handing out some brand new books to the class. You are going to read along in them as _____ reads aloud. The books are very colorful looking and look like they will really be interesting. They are so new, they have never been opened by anyone else. _____ is just about through handing them out, but as she gets to you, she finds she has run short of books and tells you that you will have to share with someone else. Everyone else has their own book but you. What do you do? (Same process as in B)

Visualizations in the Classroom (continued)

D. It's recess. You are out on the playground, enjoying yourself. You see a game of four square going on and you feel like playing too. There is only one person waiting in line for a turn to play. So you won't have to wait very long. You start to walk over to the game, and just before you get there, four other kids come running up and get to the line before you do. Now you'll have to wait a lot longer to play. What do you feel like? What do you do?

E. You are out on the playground and you see two kids playing basketball. You decide you want to play too. So you run over to the court and grab the ball away from the players as it is bouncing. What do you think will happen?

F. You are watching a game of tetherball being played by two kids. You suddenly feel like hitting the ball too. You run over into the middle of the game and sock it as hard as you can. What do you think will happen? What could you have done instead? (If child says, "Not hit it," ask how they would control themselves - suggest think aloud.)

aq

THINK ALOUD PROCEDURE

1. Model behavior, talking outloud.
2. Model behavior, have child tell you what you're doing.
3. Have child do behavior, talking outloud as they do it.
4. Have child do behavior, whispering.
5. Have child do silently.

THINK ALOUD PHRASES

1. What is my problem? What am I supposed to do?
2. How can I do it? What is my plan?
3. Am I using my plan?
4. How did I do?